What is claimed is:

1. Apparatus for conducting electrophoresis, said apparatus comprising:

a chamber defining an electrophoresis area, said area comprising a gel matrix, said chamber further comprising a sealed region;

an anode within said chamber and in contact with said gel matrix, wherein said anode is contained within said sealed region; and

a cathode within said chamber and in contact with said gel matrix.

2. The apparatus of claim 1, wherein said sealed region is sealed before and during the electrophoresis.

3. The apparatus of claim 1, wherein said anode comprises an electrochemical ionizable conducting material.

4. The apparatus of claim 3, wherein said electrochemical ionizable conducting material is a metal.

5. The apparatus of claim 4, wherein said anode comprises copper.

6. The apparatus of claim 4, wherein said anode is selected from the group consisting of silver and lead.

7. The apparatus of claim 1, wherein said anode comprises oxygen-absorbing material.

8. The apparatus of claim 1, wherein said anode is selected from the group consisting of aluminum and carbon.

9. The apparatus of claim 1, wherein said gel matrix is substantially free from oxygen gas during said electrophoresis.

10. The apparatus of claim 1, wherein said chamber further comprises one or more apertures corresponding to one or more loading sites in said chamber.

11. The apparatus of claim 10, wherein said sealed region includes said anode and does not include said one or more apertures.

12. The apparatus of claim 10, wherein said apertures corresponding to said loading sites are spaced at predetermined intervals so as to conform with intervals between tips on a loader.

13. The apparatus of claim 12, wherein said apertures are arranged in one or more rows.

14. The apparatus of claim 13 wherein said rows are arranged in a stagger format.

15. The apparatus of claim 1, wherein said chamber further comprises multiple anodes and cathodes.

16. Apparatus for conducting electrophoresis, said apparatus comprising:

a chamber defining an electrophoresis area, said area comprising a gel matrix, said chamber further comprising a sealed region;

a cathode within said chamber and in contact with said gel matrix, wherein said cathode is contained within said sealed region of the chamber; and

an anode within said chamber and in contact with said gel matrix.

17. The apparatus of claim 16, wherein said region is sealed before and during the electrophoresis.

18. The apparatus of claim 16, further comprising a matrix, wherein said matrix is in contact with said cathode, said matrix comprising at least one water sparingly soluble salt, said gel matrix comprising ions, said ions generated during an electrochemical reaction of said matrix in contact with said cathode.

19. The apparatus of claim 16 wherein said cathode comprises hydrogen-absorbing material.

20. The apparatus of claim 19, wherein said cathode is selected from the group consisting of palladium, carbon and metal hydrides.

21. The apparatus of claim 16, wherein said gel matrix is substantially free from hydrogen gas during said electrophoresis.

22. The apparatus of claim 16, wherein said chamber further comprises one or more apertures corresponding to one or more loading sites in said chamber.

23. The apparatus of claim 22, wherein said sealed region includes said cathode and does not include said one or more apertures.

24. The apparatus of claim 22, wherein said apertures corresponding to said loading sites are spaced at predetermined intervals so as to conform with intervals between tips on a loader.

25. The apparatus of claim 24, wherein said apertures are arranged in one or more rows.

26. The apparatus of claim 25, wherein said rows are arranged in a stagger format.

27. Apparatus for conducting electrophoresis, said apparatus comprising:

a chamber defining an electrophoresis area, said area comprising a gel matrix, said chamber further comprising a first sealed region and a second sealed region;

an anode within said chamber and in contact with said gel matrix, wherein said anode is contained within said first sealed region; and

a cathode within said chamber and in contact with said gel matrix, wherein said cathode is contained within said second sealed region.

28. The apparatus of claim 27, further comprising a matrix, wherein said matrix is in contact with said cathode, said matrix comprising at least one water sparingly soluble salt, said gel matrix comprising ions, said ions generated during an electrochemical reaction of said matrix in contact with said cathode.

29. The apparatus of claim 27, wherein said anode comprises an electrochemical ionizable conducting material.

30. The apparatus of claim 29, wherein said anode comprises an electrochemical ionizable metal.

31. The apparatus of claim 30, wherein said anode comprises copper.

32. The apparatus of claim 30, wherein said anode is selected from the group consisting of silver and lead.

33. The apparatus of claim 27, wherein said anode comprises oxygen-absorbing material.

34. The apparatus of claim 33, wherein said anode is selected from the group consisting of aluminum and carbon.

35. The apparatus of claim 27, wherein said cathode comprises hydrogen-absorbing material.

36. The apparatus of claim 35, wherein said cathode is selected from the group consisting of palladium, carbon and metal hydrides.

37. The apparatus of claim 27, wherein said gel matrix is substantially free from hydrogen and oxygen gas during said electrophoresis.

38. The apparatus of claim 27, wherein said chamber further comprises one or more apertures corresponding to one or more loading sites in said chamber.

39. The apparatus of claim 38, wherein said first sealed region includes said anode and does not include said one or more apertures.

40. The apparatus of claim 38, wherein said second sealed region includes said cathode and does not include said one or more apertures.

41. The apparatus of claim 38, wherein said apertures corresponding to said loading sites are spaced at predetermined intervals so as to conform with intervals between tips on a loader.

42. The apparatus of claim 38, wherein said apertures corresponding to said loading sites are arranged in one or more rows.

43. The apparatus of claim 42, wherein said rows are arranged in a stagger format.

44. The apparatus of claim 27, wherein said chamber further comprises multiple anodes and cathodes.

45. An apparatus for conducting electrophoresis the apparatus comprising:

a chamber defining an electrophoresis area, said electrophoresis area having at least one body of gel matrix for facilitating said electrophoresis;

a first electrode; and

a second electrode,

wherein said first electrode is an anode, wherein said second electrode is a cathode, and wherein said first electrode and said second electrode are each in contact with said chamber, at least one of said first electrode and said second electrode is embedded within said at least one body of gel matrix,

and wherein said at least one body of gel matrix comprises ions located within said gel matrix, said ions generated during an electrochemical reaction of said first electrode.

46. The apparatus of claim 45, wherein said anode comprises an electrochemical ionizable conducting material.

47. The apparatus of claim 45, wherein said electrochemical ionizable conducting material is a metal.

48. The apparatus of claim 47, wherein said anode comprises copper.

49. The apparatus of claim 47, wherein said anode is selected from the group consisting of silver and lead.

50. The apparatus of claim 45, wherein said gel matrix is substantially free from oxygen gas during electrophoresis.

51. The apparatus of claim 45, wherein said gel is an aqueous gel, and wherein said electrochemical reaction is not water electrolysis.

52. The apparatus of claim 45, wherein said chamber further comprises multiple anodes and cathodes.

53. An apparatus for conducting electrophoresis the apparatus comprising:

a chamber defining an electrophoresis area, said electrophoresis area having at least one body of a gel matrix for facilitating said electrophoresis;

a first electrode; and

a second electrode,

wherein said first electrode and said second electrode are in contact with said chamber, and at least one of said first electrode and said second electrode is embedded within said at least one body of the gel matrix, wherein

said first electrode is an anode and said second electrode is a cathode,

said at least one body of said gel matrix comprises electrolyte solution,

said anode comprises an electrochemically ionizable metal, and

said electrolyte solution is of a composition such that migration of ions generated during an electrochemical reaction at said anode is inhibited, wherein said electrochemical reaction is not water electrolysis.

54. The apparatus of claim 53 wherein said anode comprises copper.

55. The apparatus of claim 53 wherein said anode comprises silver.

56. The apparatus of claim 53, wherein said electrolyte solution is selected from the group consisting of Bis-Tris-Tricine, Bis-Tris-Bicine, Tris-Glycine, Bis-Tris-Glycilglycine, Amino methyl propanol-Proline, and TBE.

57. The apparatus of claims 53, wherein said chamber further comprises one or more apertures corresponding to one or more loading sites in said chamber.

58. The apparatus of claim 57, wherein said apertures corresponding to said loading sites are spaced at predetermined intervals so as to conform with intervals between tips on a loader.

59. The apparatus of claim 58, wherein said apertures corresponding to said loading sites are arranged in one or more rows.

60. The apparatus of claim 59, wherein said rows are arranged in a stagger format.

61. The apparatus of claim 53, wherein said chamber further comprises multiple anodes and cathodes.

62. An apparatus for conducting electrophoresis the apparatus comprising:

a chamber defining an electrophoresis area, said chamber comprising a sealed region, said electrophoresis area comprising at least one body of gel matrix for facilitating said electrophoresis;

a first electrode; and

a second electrode,

wherein said first and said second electrodes are in contact with said chamber, at least one of said first and said second electrodes is embedded within said at least one body of gel matrix, said first electrode is an anode and said second electrode is a cathode,

said at least one body of said gel matrix comprises electrolyte solution,

said anode is contained within said sealed region and comprises an electrochemically ionizable metal, and

said electrolyte solution is of a composition such that migration of ions generated during an electrochemical reaction at said anode is inhibited, wherein said electrochemical reaction is not water electrolysis.

63. The apparatus of claim 62, wherein said anode comprises copper.

64. The apparatus of claim 62, wherein said anode comprises silver.

65. The apparatus of claim 62, wherein said electrolyte solution is selected from the group consisting of Bis-Tris-Tricine, Bis-Tris-Bicine, Tris-Glycine, Bis-Tris-Glycilglycine, Amino methyl propanol-Proline, and TBE.

66. The apparatus of claim 62, wherein said chamber further comprises one or more apertures corresponding to one or more loading sites in said chamber.

67. The apparatus of claim 66, wherein said apertures corresponding to said loading sites are spaced at predetermined intervals so as to conform with intervals between tips on a loader.

68. The apparatus of claim 67, wherein said apertures corresponding to said loading sites are arranged in one or more rows.

69. The apparatus of claim 68, wherein said rows are arranged in stagger format.

70. The apparatus of claim 62, wherein said chamber further comprises multiple anodes and cathodes.

71. A method for electrophoresis, the method comprising the steps of:

applying an electrical field to a gel;

degrading a metal anode by said application of said electrical field; and

releasing ions required for maintaining an electrical field by said degradation.

72. The method of claim 71 wherein said step of releasing ions does not include water electrolysis in the vicinity of the anode.

73. A method for electrophoresis, the method comprising the steps of:

applying an electrical field to a gel;

degrading a sparingly water-soluble salt in contact with a cathode by said application of said electrical field; and

releasing ions required for maintaining an electrical field by said degradation.

74. The method of claim 73 wherein said step of releasing ions does not include water electrolysis in the vicinity of the cathode.

75. A method for electrophoresis, the method comprising the steps of:

applying an electrical field to a gel;

degrading a metal anode by said application of said electrical field;

degrading a sparingly water-soluble salt in contact with a cathode by said application of said electrical field; and

releasing ions required for maintaining an electrical field by said degradations.

76. The method of claim 75, wherein said step of releasing ions does not include water electrolysis.

77. A method for electrophoresis, the method comprising the steps of:

applying an electrical field to a gel;

degrading a metal anode by said application of said electrical field;
releasing ions required for maintaining an electrical field by said degradation; and
inhibiting migration of said ions in the vicinity of said anode.

78. A method as in claim 77, wherein said step of releasing ions does not include water electrolysis.